



Docket No.: K-018

PATENT

At #
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12/8/03

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In re Application of

Tae Woon KIM

Application No.: 09/055,984

: Group Art Unit: 2665

Confirm. No.: 4692

: Examiner: NGUYEN, Toan D.

Filed: April 7, 1998

: Customer No.: 34610

For: CDMA MOBILE DATA COMMUNICATION SYSTEM AND A METHOD OF
WIRELESS DATA COMMUNICATION USING THE SAME

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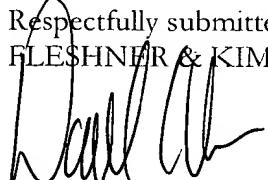
U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window, Mail Stop Appeal Brief-Patents
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

Submitted herewith in triplicate is Appellant's Appeal Brief in support of the Notice of Appeal filed October 2, 2003. Enclosed is Check No. 10787 for the Appeal Brief fee of \$330.00.

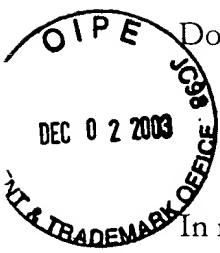
To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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For: CDMA MOBILE DATA COMMUNICATION SYSTEM AND A METHOD
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APPEAL BRIEF

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2011 South Clark Place
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Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

This Appeal Brief is submitted in support of the Notice of Appeal filed October 2, 2003.

That is, this appeal is taken from the rejection of claims 1-11, 13, 16, 17, 21, 22, 27-36 and 38-49.

Claim 14 has not been rejected in the outstanding Office Action, but is being provided as a claim on appeal.

Applicant gratefully acknowledges the Office Action's indication that claims 12, 15, 18-20, 23-26 and 37 contain allowable subject matter. Claims 12, 15, 18-20, 23-26 and 37 are therefore not considered claims on appeal.

Adjustment date: 12/04/2003 AWONDAF1
12/03/2003 SDENB001 00000120 09055984
01 FC:1401 -330.00 0P
12/03/2003 SDENB001 00000120 09055984
01 FC:1401 330.00 0P

12/04/2003 AWONDAF1 00000020 09055984
01 FC:1402 330.00 0P

REAL PARTY IN INTEREST

The party in interest is the assignee, LG Information & Communications, Ltd. The assignment document is recorded at Reel 9106 and Frame 0995.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

STATUS OF THE CLAIMS

Claims 1-49 are pending in this application. This is an appeal from the rejections set forth in the Office Action dated July 2, 2003 of claims 1-11, 13, 16, 17, 21, 22, 27-36 and 38-49. The Office Action does not address claim 14.

The outstanding Office Action also indicates that claims 12, 15, 18-20, 23-26 and 37 contain allowable subject matter. These claims therefore are not subject to this appeal.

STATUS OF AMENDMENTS

All Amendments (to the claims) filed in this application have been entered. A copy of appealed claims 1-11, 13, 14, 16, 17, 21, 22, 27-36 and 38-49 appears in the attached Appendix. Claims 12, 15, 18-20, 23-26 and 37 are not listed since they are not subject to appeal. Applicant is also simultaneously filing an Amendment to amend the Abstract as requested in the July 2

Office Action. The filing of this Amendment does not effect the scope of the claims and/or this appeal.

SUMMARY OF THE INVENTION

The present application relates to a CDMA mobile data communication system for a mobile-to-mobile data communication between mobile stations in which a mobile terminal and a data terminal are linked to each other. See page 3, lines 12-18 of the present specification. As shown in Figure 1, the CDMA mobile data communication network includes mobile stations (including mobile terminal 11 and data terminal 10 connected to each other), base station and base station controller 21, 22, mobile switching center 31a, 31b, and data network interworking unit 100. The mobile switching centers 31a and 31b change a signal path according to a service option obtained by the analysis of a signal transmitted from the base station and base station controller 21 and 22. The data network interworking unit 100 establishes a call between a calling party and a called party and establishes a traffic channel of mobile data path when the mobile switching center 31a and 31b performs its circuit data service. See page 9, line 16-page 10, line 8.

Each mobile switching center 31a and 31b has a function for analyzing the signal transmitted from the base station and base station controller 21 and 22 to obtain a service option and a switching function for switching the signal path according to the service option. Additionally, the data network interworking unit 100 has a modem and each mobile station need

not have a modem when wireless communication is performed between mobile stations. See page 11, lines 4-12.

Figure 2 shows details of the mobile switching center 31a including a mobile connection control module 33, a mobile data path connection control module 34, a public network data path connection control module 35 and a trunk connection control module 36. Figure 2 further shows details of the mobile data network interworking unit 100 including mobile data path connection module 101, public network data path connection module 102 and packet network data path connection module 103. See page 11, line 13-page 14, line 10. Figure 2 also shows the mobile data path and the public network data path between the mobile switching center 31a and the mobile data network interworking unit 100.

The mobile connection control module 33 generates a switching signal to switch the signal path by deciding a service option included in the signal transmitted from the base station and base station controller 21. The mobile data path connection control module 34 controls the connection of mobile data path according to the output signal of the mobile connection control module 33. The public network data path connection control module 35 controls the connection of PSTN data path according to the output signal of the mobile data network interworking unit 100. The trunk connection control module 36 transmits an output signal of the public network or the mobile data path connection control module 34 and 35 to the PSTN 200 or other mobile switching center 31b according to the output signal of the mobile connection control module 33 or the public network data path connection control module 35.

See page 11, line 13-page 12, line 5

ISSUES

1. Whether claims 1-5, 9, 27, 31, 38-41 and 44-46 are unpatentable under 35 U.S.C. §102(e) over U.S. Patent 6,570,871 to Schneider.
2. Whether claims 6-8, 10-11, 13, 16-17, 28-30, 32-36, 42-43 and 47-49 are unpatentable over Schneider in view of U.S. Patent 5,850,391 to Essigmann.
3. Whether claims 21 and 22 are unpatentable over Schneider in view of Essigmann and further in view of U.S. Patent 5,910,946 to Csapo.

GROUPING OF THE CLAIMS

Each of claims 1-11, 13, 14, 16, 17, 21-36 and 38-49 stands or falls separately from one another. Each of claims 12, 15, 18-20, 23-26 and 37 has been indicated as being allowable over the prior art. Each of these claims 12, 15, 18-20, 23-26 and 37 therefore stands or falls separately from one another and from the appealed claims.

THE ARGUMENT

The present application includes six independent claims, namely claims 1, 10, 21, 27, 32 and 35. The claims contain different features as may be evidenced by the specifically claimed features and as may be pointed out below. For ease of illustration, similar types of claims (or claimed features) may be discussed with respect to each other. This is not an admission that the claims are the same or that they stand and fall together. Rather, this is an attempt to narrow the

number of issues and to limit the number of arguments. While arguments may be similar for different claims, it should be understood that different claim features are expressly used.

The Office Action rejects claims 1-5, 9, 27, 31, 38-41, and 44-56 under 35 U.S.C. § 102(e)

over U.S. Patent 6,570,871 to Schneider. This rejection is respectfully traversed

Independent claim 1 recites a mobile switching center for detecting a service option included in the signal transmitted from the base stations and base station controllers and for executing a circuit data service or a packet data service according to the detected service option.

Schneider relates to an Internet telephone service using a cellular digital vocoder. As shown in Figure 2 of Schneider, mobile switching centers 62a, 62b connect to the Internet 72 through corresponding gateway interfaces 74a, 74b. Accordingly, each of the MSCs is connected to a packet switched network. See column 7, lines 55-26. Additionally, Schneider discloses that a central office 76 may have access to the packet switched network 72 via a gateway interface 74c. See column 7, lines 58-60. Additionally, each MSC may also route traffic through a public switched telephone network 84. In such a circumstance, a transcoder is used to transcode the digital voice samples. See column 4, lines 44-56. Schneider thus discloses that an alternate transfer path for voice traffic can be provided by using the public switched telephone network and the Internet.

However, Schneider does not teach or suggest all the features of independent claim 1. Schneider does not teach or suggest that the mobile switching center detects a service option, and executes (1) circuit data service or (2) packet data service according to the detected service option. Schneider also does not teach or suggest that a mobile data network interworking unit

establishes a traffic channel of a mobile data path and a call between calling party mobile station in a call party mobile station when the mobile switching center performs a circuit data service. In fact, Schneider does not suggest that the interworking function is used for any communications whatsoever.

More specifically with respect to independent claim 1, Schneider does not teach or suggest at least a plurality of mobile stations, a plurality of base stations and base station controllers for transferring a signal transmitted from the mobile stations and a signal transmitted to the mobile stations in a predetermined service area, a mobile switching center for detecting a service option included in the signal transmitted from the base stations and base station controllers and for executing a circuit data service or a packet data service according to the detected service option, and at least one mobile data network interworking unit for establishing a traffic channel of a mobile data path and a call between a called party mobile station when the mobile switching center performs the circuit data service, wherein first and second data paths are established between the mobile switching center and the least one mobile data network interworking unit, as recited in independent claim 1. Accordingly, independent claim 1 defines patentable subject matter.

Claims 2-9 and 38-41 depend from claim 1 and therefore define patentable subject matter at least for this reason. In addition, the dependent claims also recite features that further and independently distinguish over the applied references. The other applied references of Essigmann and Csapo do not teach or suggest the features of independent claim 1 as well as the additional features of the dependent claims 2-9 and 38-41 that are missing from Schneider.

Independent claim 27 recites a mobile switching center (MSC) configured to detect a service option included in the signal transmitted from the at least one base station and base station controller and to execute a circuit data service or a packet data service according to the detected service option, and at least one mobile data network interworking unit coupled to the MSC to establish a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when the mobile switching center performs the circuit data service.

Schneider does not teach or suggest at least one base station controller, configured to receive and transfer a signal from at least one mobile station and a signal transmitted to the at least one mobile station in a prescribed service area, a mobile switching center (MSC) configured to detect a service option included in the signal transmitted from the at least one base station and base station controller and to execute a circuit data service or a packet data service according to a detected service option, and at least one mobile data network interworking unit coupled to the MSC to establish a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when the mobile switching center performs the circuit data service, wherein first and second data paths are established between the MSC and the least one mobile data network interworking unit, as recited in independent claim 27. Accordingly, independent claim 27 defines patentable subject matter.

Claims 28-31 and 42-46 depend from claim 27 and therefore define patentable subject matter at least for this reason. In addition, the dependent claims also recite features that further and independently distinguish over the applied references. The other applied references of

Essigmann and Csapo do not teach or suggest the features of independent claim 27 as well as the additional features of the dependent claims 28-31 and 42-46 that are missing from Schneider.

The Office Action rejects claims 6-8, 10, 11, 13, 16, 17, 28-30, 32-36, 42, 43, and 47-49 under 35 U.S.C. §103(a) over Schneider in view of U.S. Patent 5,850,391 to Essigmann. This rejection is respectfully traversed.

The asserted combination of Schneider and Essigmann does not establish a *prima facie* case of obviousness, as required by Section 103.

For example, the combination of Schneider and Essigmann does not teach or suggest inputting an identification number of a called party mobile station, establishing a first call from a calling party mobile station to a mobile data network interworking unit and then establishing a first traffic channel, calling the called party mobile station at the mobile data network interworking unit, establishing a second call from the called party mobile station to the mobile data network interworking unit when a data response comes from the called party mobile station and then establishing a second traffic channel after the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path between a mobile switching center and the mobile data network interworking unit, establishing a call between the mobile switching center and the mobile data network interworking unit through a second data path, and connecting the first and second traffic channels through at least one modem of the interworking unit to perform circuit data service, as recited in independent claim 10. Independent claim 10 therefore defines patentable subject matter.

Claims 11, 13, 14, 16, and 17 depend from claim 10 and therefore define patentable subject matter at least for this additional reason. In addition, the dependent claims recite features that further and independently distinguish over the applied references. The other applied reference of Csapo do not teach or suggest the features of independent claim 10 as well as the additional features of the dependent claims 11, 13, 14, 16 and 17 that are missing from Schneider and Essigmann.

The Office Action does not reject dependent claim 14. Dependent claim 14 therefore defines patentable subject matter. Because claim 14 has not been grouped together with the other claims in the Office Action, claim 14 stands or falls separately from the other claims.

Moreover, the asserted combination of Schneider and Essigmann does not teach or suggest at least a data path connector to couple over at least first and second paths to a mobile switching center, a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station, a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor, and a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor to perform circuit data service, wherein the circuit data processor comprises at least

one modem as recited in independent claim 32. Independent claim 32 therefore defines patentable subject matter.

Claims 33, 34, and 47-49 depend from claim 32 and therefore define patentable subject matter at least for this additional reason. In addition, the dependent claims recite features that further and independently distinguish over the applied references. The other applied reference of Csapo do not teach or suggest the features of independent claim 32 as well as the additional features of the dependent claims 33, 34 and 47-49 that are missing from Schneider and Essigmann.

Additionally, the asserted combination of Schneider and Essigmann does not teach or suggest at least inputting an identification number of a first mobile station, establishing a first call from a second mobile station to a said mobile data network interworking unit and then establishing a first traffic channel, calling a first mobile station at the mobile data network interworking unit, establishing a second call from the first mobile station to the mobile data network interworking unit when a data response comes from the first mobile station and establishing a second traffic channel after a mobile data path connection module informs a public network data path connection control module of a normal state of the first data path, establishing a call between a mobile switching center and the mobile data network interworking unit through the second data path, and connecting the first and second traffic channels through at least one modem of the mobile data network interworking unit to perform circuit data service as recited in independent claim 35. Independent claim 35 therefore defines patentable subject matter.

Claim 36 depends from claim 35 and therefore defines patentable subject matter at least for this additional reason. In addition, the dependent claims recite features that further and independently distinguish over the applied references. The other applied reference of Csapo does not teach or suggest the features of independent claim 35 as well as the additional features of the dependent claim 36 that are missing from Schneider and Essigmann.

Still further, claims 6-8 depend from independent claim 1, and claims 28-30, 42 and 43 depend from independent claim 27. As discussed above, Schneider does not teach or suggest all of the features of independent claims 1 and 27. Essigmann and Csapo do not teach or suggest the features of independent claims 1 and 27 (or claims 6-8, 28-30, 42 and 43) missing from Schneider. Consequently, claims 6-8, 28-30, 42, and 43 define patentable subject matter at least for this additional reason. In addition, the dependent claims recite features that further and independently distinguish over the applied references.

The Office Action also asserts that Schneider teaches establishing a second call from a called party mobile station to the mobile data network interworking unit when a data response comes from the called party mobile station, and then establishing a second traffic channel after the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path between a mobile switching center and the mobile data network interworking unit. The Office Action further asserts that Schneider teaches establishing a call between the mobile switching center and mobile data network interworking unit to the second data path. To support these assertions, the Office Action cites to Schneider,

column 7, lines 55-35. Applicant respectfully submits that the cited reference does not teach or suggest the asserted features.

For example, as discussed above, Schneider does not teach or suggest using an interworking unit for any communications. Moreover, Schneider does not teach or suggest establishing a second call from the called party mobile station to the interworking unit. Schneider also does not teach or suggest that a second call is established when a data response comes from the called party mobile station. Moreover, because a second data path is not established, Schneider does not teach or suggest establishing a call between the mobile switching center and the mobile data network interworking unit through a second data path.

Additionally, the Office Action admits that Schneider does not teach or suggest one modem in an interworking unit. The Office Action further relies upon Essigmann for the feature of a modem of the interworking unit.

Essigmann teaches using a shared interworking function, the interworking function including a modem. However, Essigmann, either alone or a combination with Schneider, does not teach or suggest establishing a second call from a called party mobile station to the mobile data network interworking unit when a data response comes from the called party mobile station. Moreover, the combination of references does not teach or suggest establishing a second traffic channel after the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path between the mobile switching center and the mobile data network interworking unit. Finally, the combination of references does not teach or suggest establishing a call between the mobile switching center and

the mobile data network interworking unit through a second data path, or connecting the first and second traffic channels through at least one modem to perform circuit data service. Additionally, there is no teaching or suggestion in either the references to use an interworking function having the at least one modem in the manner recited in the claims.

Accordingly, the asserted combination of references fails to teach or suggest all of the claimed features, as required by Section 103. Because a *prima facie* case of obviousness cannot be established, withdrawal of this rejection based on the combination of Schneider and Essigmann is therefore respectfully requested.

The Office Action also rejects claims 21 and 22 under 35 U.S.C. §103(a) over Schneider in view of Essigmann, and in further view of U.S. Patent 5,910,946 to Csapo. This rejection is respectfully traversed.

The asserted combination of references does not establish a *prima facie* case of obviousness, as required by Section 103. Schneider and Essigmann are described above. Csapo relates to wireless Internet network architecture for voice and data communications. Moreover, the Office Action states that Csapo is relied on to teach releasing the traffic channel between the mobile communication control module and the public network data path connection control module.

However, as discussed above, the asserted combination of references does not teach or suggest inputting an identification number of a called party mobile station, establishing a first traffic channel after establishing a first call from a calling party mobile station to a first mobile data network interworking unit having at least one modem through a first mobile switching

center, calling a called party mobile station controlled by a second mobile switching center from the first mobile data network interworking unit through the public network data path connection control module and the trunk connection control module, establishing a second traffic channel after a second call from said called party mobile station to a second mobile data network interworking unit having at least one modem is established when the called party mobile station responds and the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path, establishing a call between the public network data path connection control module and the second mobile data network interworking unit after the mobile data path connection control module informs the public network data path connection control module of the completion of channel establishment when the second traffic channel is completely established, releasing the traffic channel between the mobile connection control module and the public network data path connection control module when the call establishment between the public network data path connection control module and the second mobile data network interworking unit is complete, and connecting said public network path connection control module with the trunk connection control module as recited in independent claim 21.

Accordingly, a *prima facie* case of obviousness cannot be established. Independent claim 21 therefore defines patentable subject matter. Claim 22 depends from claim 21 and therefore defines patentable subject matter at least for this additional reason. In addition, the dependent claims also recite features that further and independently distinguish over the applied references.

CONCLUSION

It is respectfully submitted that the above arguments show that each of the claims are patentable over the applied references. Based at least on these reasons, it is respectfully submitted that each of claims 1-49 defines patentable subject matter. Applicant requests that the rejections set forth in the July 2, 2003 Office Action be withdrawn.

Respectfully submitted,
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APPENDIX LISTING CLAIMS ON APPEAL

1. A mobile data communication system for a wireless data communication, comprising:

a plurality of mobile stations;

a plurality of base stations and base station controllers for transferring a signal transmitted from said mobile stations and a signal transmitted to said mobile stations in a predetermined service area;

a mobile switching center for detecting a service option included in the signal transmitted from the base stations and base station controllers and for executing a circuit data service or a packet data service according to the detected service option; and

at least one mobile data network interworking unit for establishing a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when said mobile switching center performs the circuit data service, wherein first and second data paths are established between the mobile switching center and the least one mobile data network interworking unit.

2. The mobile data communication system claimed in claim 1, wherein said mobile switching center comprises:

a mobile connection control module for detecting the service option included in the signal transmitted from said base station and base station controllers and for generating a switching signal controlling an interface connection;

a mobile data path connection control module for controlling the connection to a mobile network data path according to the switching signal of said mobile connection control module;

a public network data path connection control module for controlling the connection to a public network data path according to the output signal of said mobile data network interworking unit; and

a trunk connection control module for transmitting an output signal of said public network data path connection control module or said mobile network data path connection control module to a public switched telephone network or to a second mobile switching center according to the switching signal of said mobile data path control module or said public network data path connection control module.

3. The mobile data communication system claimed in claim 1, wherein said mobile station comprises a data terminal coupled to a mobile terminal .

4. A mobile data communication system claimed in claim 3, wherein said data terminal includes one of notebook, personal digital assistant, laptop, palmtop, portable or small computer.

5. A mobile data communication system claimed in claim 1, wherein each of said mobile stations includes a protocol stack for a circuit data and a call processing module for processing a packet data.

6. A mobile data communication system claimed in claim 1, wherein said mobile data network interworking unit includes:

 a data path connection section for forming a path connection between said mobile switching center and mobile data network interworking unit;

 a main processing section forming a traffic channel of a mobile data path between a calling party mobile station and a called party mobile station to execute a circuit data communication or a packet data communication according to a received signal from said data path connection section;

 a circuit data processing section analyzing the signal transmitted from said calling party mobile station if the protocol between the calling party mobile station and the called party mobile station is normally executed when said main processing section performs the circuit data service and then transmitting said called party identification number to said main processing section; and

 a switching section selectively switching the connection between said circuit data processing section and said data path connection section according to the control signal of said main processing.

7. A mobile data communication system claimed in claim 5, wherein said main processing section includes:

 a mobile data path control module for establishing a link with said mobile switching center;

 a circuit data control module controlling the exchange of the traffic data information between said mobile station and circuit data processing section;

 a modem control module controlling the modem equipped in said circuit data processing section; and

 a public network data path control module for establishing the link with said mobile switching center.

8. A mobile data communication system claimed in claim 5, wherein said circuit data processing section includes:

 an interface control section performing an interface between said main processing section and said circuit data processing section;

 at least one modems; and

 a modem controller controlling an operation of the modem according to a modem control signal of said interface control section.

9. A mobile data communication system claimed in claim 1, wherein said mobile data communication system is characterized by a CDMA mobile data communication system.

10. A wireless data communication method in which at least one mobile switching center including a mobile connection control module, a mobile data path connection control module, a public network data path connection control module and a trunk connection control module are connected with at least one data network interworking unit by a first data path and a second data path, comprising:

 inputting an identification number of a called party mobile station;
 establishing a first call from a calling party mobile station to a mobile data network interworking unit and then establishing a first traffic channel;
 calling the called party mobile station at the mobile data network interworking unit;

 establishing a second call from said called party mobile station to the mobile data network interworking unit when a data response comes from said called party mobile station and then establishing a second traffic channel after the mobile data path connection module informs the public network data path connection control module of a normal state of a first data path between a mobile switching center and the mobile data network interworking unit;

 establishing a call between the mobile switching center and the mobile data network interworking unit through a second data path; and

 connecting said first and second traffic channels through at least one modem of the interworking unit to perform circuit data service.

11. A wireless data communication method claimed in claim 10, wherein said first data path is a mobile data path and said second data path is a public network data path.

13. The wireless data communication method claimed in claim 10, wherein said steps for establishing the first call comprises:

deciding a service option included in the signal transmitted from said calling party mobile station; and

requesting said data network interworking unit to establish a call when said service option is to request a circuit data communication service.

14. A wireless data communication method claimed in claim 10, wherein said step of establishing the first traffic channel includes the steps of:
 - initializing a first modem equipped in said data network interworking unit;
 - connecting a path between said calling party mobile station and said data network interworking unit to modem;
 - establishing a communication protocol between said calling party mobile station and said data networking unit;
 - transmitting the identification number of said calling party mobile station and said modem initialization specification from said calling party mobile station to said first modem; and

reestablishing with a modem initialization specification required by said calling party mobile station.

16. A wireless data communication method claimed in claim 10, wherein said step of said called party mobile station includes the steps of:

transmitting a connection request message from said mobile data network interworking unit to said mobile switching center;
requesting an incoming connection from said mobile station to said called party mobile station; and calling a mobile terminal of said called party mobile station.

17. A wireless data communication method claimed in claim 10, wherein the step of establishing said second call includes the steps of:

deciding a service option included in the signal transmitted from said called party mobile station; and
requesting said data network interworking unit to establish a call when a decision on said service option is for a circuit data communication service.

21. A wireless data communication method in which at least one mobile switching center having a mobile connection control module, a mobile data path connection control module, a public network data path connection control module and a trunk connection control

module is connected with at least one data network interworking unit through a first data path and a second data path to perform circuit data service, comprising:

- a) inputting an identification number of a called party mobile station;
- b) establishing a first traffic channel after establishing a first call from a calling party mobile station to a first mobile data network interworking unit having at least one modem through a first mobile switching center;
- c) calling a called party mobile station controlled by a second mobile switching center from said first mobile data network interworking unit through said public network data path connection control module and said trunk connection control module;
- d) establishing a second traffic channel after a second call from said called party mobile station to a second mobile data network interworking unit having at least one modem is established when said called party mobile station responds and said mobile data path connection module informs said public network data path connection control module of a normal state of a first data path;
- e) establishing a call between said public network data path connection control module and said second mobile data network interworking unit after said mobile data path connection control module informs said public network data path connection control module of the completion of channel establishment when said second traffic channel is completely established;

f) releasing the traffic channel between said mobile connection control module and said public network data path connection control module when the call establishment between the public network data path connection control module and said second mobile data network interworking unit is completed; and

g) connecting said public network data path connection control module with the trunk connection control module.

22. The method of claim 21, wherein establishing the first traffic channel comprises:
 - initializing a first modem equipped in the data network interworking unit;
 - connecting a path between said calling party mobile station and the data network interworking unit to modem;
 - establishing a communication protocol between said calling party mobile station and the data networking unit;
 - transmitting the identification number of said calling party mobile station and said modem initialization specification from said calling party mobile station to the first modem; and
 - reestablishing with a modem initialization specification required by said calling party mobile station.

27. A mobile data communication system, comprising:

at least one base station and base station controller, configured to receive and transfer a signal from at least one mobile station and a signal transmitted to the at least one mobile station in a prescribed service area;

a mobile switching center (MSC) configured to detect a service option included in the signal transmitted from the at least one base station and base station controller and to execute a circuit data service or a packet data service according to the detected service option;

and

at least one mobile data network interworking unit coupled to the MSC to establish a traffic channel of a mobile data path and a call between a calling party mobile station and a called party mobile station when said mobile switching center performs the circuit data service, wherein first and second data paths are established between the MSC and the least one mobile data network interworking unit.

28. The system of claim 27, wherein the at least one mobile data network interworking unit comprises:

a main processing circuit configured to form the traffic channel of the mobile data path and the call between the calling party mobile station and the called party mobile station;

a circuit data processing circuit configured to transmit the called party identification number to the main processing circuit if the main processing circuit is performing a circuit data service;

a packet data processing circuit configured to transmit the called party identification number to the main processing circuit if the main processing circuit is performing a packet data service;

an interface control section, configured to provide an interface between the main processing circuit and the circuit data processing circuit;

at least one modem; and

a modem controller configured to control an operation of the at least one modem according to a modem control signal of the interface control section.

29. The system of claim 27, wherein the at least one mobile data network interworking unit, comprises:

at least one processor;

at least one modem; and

a modem controller, configured to receive a modem control signal from the at least one processor and control the modem in accordance with the modem control signal.--

30. The system of claim 29, wherein the communication system comprises a CDMA communication system.

31. The system of claim 27, wherein the mobile switching center comprises:

- a mobile connection control module to detect a service option included in the signal transmitted from the at least one base station and base station controller, and to generate a switching signal to control an interface connection;
- a mobile data path connection control module, configured to control a connection to a mobile network data path according to the switching signal of the mobile connection control module;
- a public network data path connection control module, configured to control a connection to a public network data path according to an output signal of the mobile data network interworking unit; and
- a trunk connection control module, configured to transmit an output signal of one of the public network data path connection control module and the mobile data path connection control module to one of a public switched telephone network and a second mobile switching center according to the output signal of the mobile data path control module or the public network data path connection control module.

32. An interworking unit for a wireless communication system, comprising:
 - a data path connector to couple over at least first and second data paths to a mobile switching center;
 - a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station;
 - a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor; and
 - a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor to perform circuit data service, wherein the circuit data processor comprises at least one modem.

33. The mobile data communication system claimed in claim 32, wherein the main processor comprises:
 - a mobile data path control module coupled to establish a link with the mobile switching center;

a circuit data control module configured to control the exchange of traffic data information between the first mobile terminal and a circuit data processor;

a modem control module configured to control the at least one modem; and

a public network data path control module coupled to establish the link with the mobile switching center.

34. The mobile data communication system claimed in claim 32, wherein the circuit data processor comprises:

an interface controller to provide an interface between the main processor and the circuit data processor; and

a modem controller coupled to control an operation of the at least one modem according to a modem control signal provided by the interface controller.

35. A method of performing wireless data communications, comprising:

inputting an identification number of a first mobile station;

establishing a first call from a second mobile station to a said mobile data network interworking unit and then establishing a first traffic channel;

calling the first mobile station at the mobile data network interworking unit;

establishing a second call from the first mobile station to the mobile data network interworking unit when a data response comes from the first mobile station and then

establishing a second traffic channel after a mobile data path connection module informs a public network data path connection control module of a normal state of the first data path;

establishing a call between a mobile switching center and the mobile data network interworking unit through the second data path; and

connecting the first and second traffic channels through at least one modem of the mobile data network interworking unit to perform circuit data service.

36. The method of claim 35, wherein the first data path is a mobile data path and the second data path is a public network data path.

38. The system of claim 1, wherein the at least one mobile data network interworking unit comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

39. The system of claim 38, wherein the at least one mobile data network interworking unit comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

40. The method of claim 1, wherein the first data path is a mobile data path and the second data path is a public network data path.

41. The mobile data communication system claimed in claim 6, wherein the data terminal and the mobile terminal are integrated to form a single device.

42. The system of claim 27, wherein the at least one mobile data network interworking unit comprises:

a data path connector to couple to a mobile switching center;

a main processor to form a traffic channel of a mobile data path between a first mobile terminal and a second mobile terminal when a circuit data service option is detected by the mobile switching center from a base station;

a circuit data processor, coupled to the main processor and configured to analyze a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal and the second mobile terminal is normally executed, and to transmit an identification number from the second terminal to the main processor; and

a switching circuit, configured to selectively switch a connection between the circuit data processor and the data path connector in accordance with a control signal from the main processor, wherein the circuit data processor comprises at least one modem, and wherein the main processor comprises:

a mobile data path control module coupled to establish a link with the mobile switching center;

a circuit data control module configured to control the exchange of traffic data information between the first mobile terminal and a circuit data processor;

a modem control module configured to control the at least one modem;
and
a public network data path control module coupled to establish the link
with the mobile switching center.

43. The system of claim 27, wherein the at least one mobile data network
interworking unit comprises:

a data path connector to couple to a mobile switching center;
a main processor to form a traffic channel of a mobile data path between a first
mobile terminal and a second mobile terminal when a circuit data service option is detected by
the mobile switching center from a base station;
a circuit data processor, coupled to the main processor and configured to analyze
a signal transmitted from the first mobile terminal if a protocol between the first mobile terminal
and the second mobile terminal is normally executed; and to transmit an identification number
from the second terminal to the main processor; and
a switching circuit, configured to selectively switch a connection between the
circuit data processor and the data path connector in accordance with a control signal from the
main processor, wherein the circuit data processor comprises at least one modem, and wherein
the circuit data processor comprises:

an interface controller to provide an interface between the main processor
and the circuit data processor; and

a modem controller coupled to control an operation of the at least one modem according to a modem control signal provided by the interface controller.

44. The system of claim 27, wherein the at least one mobile data network interworking unit comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

45. The system of claim 44, wherein the at least one mobile data network interworking unit comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

46. The method of claim 27, wherein the first data path is a mobile data path and the second data path is a public network data path.

47. The system of claim 32, wherein the interworking unit further comprises a module for providing circuit service and a module for providing packet based service, and wherein different protocol stacks are used for packet service and circuit service.

48. The system of claim 47, wherein the interworking unit further comprises at least one module for connecting a first protocol to a second protocol for interface with the interworking function.

49. The method of claim 32, wherein the first data path is a mobile data path and the second data path is a public network data path.